

Operation codes

E.MUL.ADD. 8 Ensemble multiply signed doublets add quadlets E.MUL.ADD.32 Ensemble multiply signed quadlets add octlets E.MUL.ADD.64 Ensemble multiply signed octlets add hexlet E.MUL.ADD.C. 8 Ensemble multiply complex bytes add doublets E.MUL.ADD.C. 16 Ensemble multiply complex doublets add quadlets E.MUL.ADD.C.32 Ensemble multiply complex quadlets add octlets E.MUL.ADD.M. 8 Ensemble multiply complex quadlets add octlets E.MUL.ADD.M. 16 Ensemble multiply mixed-signed bytes add doublets E.MUL.ADD.M.32 Ensemble multiply mixed-signed doublets add quadlets E.MUL.ADD.M.32 Ensemble multiply mixed-signed quadlets add octlets E.MUL.ADD.M.64 Ensemble multiply mixed-signed octlets add hexlet E.MUL.ADD.U. 8 Ensemble multiply unsigned bytes add doublets E.MUL.ADD.U. 16 Ensemble multiply unsigned doublets add quadlets E.MUL.ADD.U.32 Ensemble multiply unsigned doublets add quadlets E.MUL.ADD.U.32 Ensemble multiply unsigned doublets add octlets E.MUL.ADD.U.64 Ensemble multiply unsigned doublets add hexlet E.MUL.SUB. 8 Ensemble multiply signed doublets subtract doublets E.MUL.SUB. 8 Ensemble multiply signed doublets subtract quadlets E.MUL.SUB. 16 Ensemble multiply signed doublets subtract quadlets E.MUL.SUB. 8 Ensemble multiply signed doublets subtract doublets E.MUL.SUB. 8 Ensemble multiply signed doublets subtract doublets E.MUL.SUB. 64 Ensemble multiply signed octlets subtract doublets E.MUL.SUB. 8 Ensemble multiply complex doublets subtract doublets E.MUL.SUB. 8 Ensemble multiply mixed-signed bytes subtract doublets E.MUL.SUB.M. 8 Ensemble multiply mixed-signed doublets subtract doublets E.MUL.SUB.M. 64 Ensemble multiply mixed-signed doublets subtract doublets E.MUL.SUB.M. 8 Ensemble multiply mixed-signed doublets subtract doublets E.MUL.SUB.M. 64 Ensemble multiply mixed-signed doublets subtract doublets E.MUL.SUB.M. 64 Ensemble multiply mixed-signed doublets subtract doublets E.MUL.SUB.W. 64 Ensemble multiply unsigned doublets subtract doublets E.MUL.SUB.U. 64 Ensemble multiply unsigned doublets subtract doublets E.MUL.SU		
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E.MUL.SUB.U. 8 Ensemble multiply unsigned bytes subtract doublets E.MUL.SUB.U.16 Ensemble multiply unsigned doublets subtract quadlets E.MUL.SUB.U.32 Ensemble multiply unsigned quadlets subtract octlets	E.MUL.SUB.M.32	Ensemble multiply mixed-signed quadlets subtract octlets .
E.MUL.SUB.U.16 Ensemble multiply unsigned doublets subtract quadlets E.MUL.SUB.U.32 Ensemble multiply unsigned quadlets subtract octlets	E.MUL.SUB.M.64	Ensemble multiply mixed-signed octlets subtract hexlet
E.MUL.SUB.U.32 Ensemble multiply unsigned quadlets subtract octlets	E.MUL.SUB.U. 8	
	E.MUL.SUB.U.16	
E.MUL.SUB.U.64 Ensemble multiply unsigned octlets subtract hexlet	E.MUL.SUB.U.32	
	E.MUL.SUB.U.64	Ensemble multiply unsigned octlets subtract hexlet

Selection

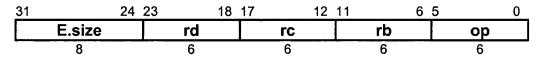
class	ор	type	prec			
multiply	E.MUL.ADD	NONE M U	8	16	32	64
complex multiply	E.MUL.SUB	С	8	16	32	0



E.op.size rd@rc,rb

Format

rd=gopsize(rd,rc,rb)



New Sheet



Definition

```
def mul(size,h,vs,v,i,ws,w,j) as
        mul \leftarrow ((vs\&v_{size-1+i})^{h-size} || v_{size-1+i..i}) * ((ws\&w_{size-1+i})^{h-size} || w_{size-1+i..i})
enddef
def EnsembleInplace(op,size,rd,rc,rb) as
        if size=1 then
                raise ReservedInstruction
        endif
        d ← RegRead(rd, 128)
        c \leftarrow RegRead(rc, 128)
       b \leftarrow RegRead(rb, 128)
        case op of
                E.MUL.ADD, E.MULSUB, E.MUL.ADDC, E.MULSUBC:
                         bs ← 1
                E.MUL.ADDM, E.MULSUBM:
                         cs \leftarrow 0
                         bs \leftarrow 1
                E.MUL.ADDU, E.MULSUBU:
                         cs \leftarrow 0
                         bs \leftarrow 0
        endcase
       h ← 2*size
       for i \leftarrow 0 to 64-size by size
                di ← d2*(i+size)-1..2*i
                case op of
                         E.MUL.ADD, E.MUL.ADDU, E.MUL.ADDM:
                                 p \leftarrow \text{mul}(\text{size}, h, \text{cs}, c, i, \text{bs}, b, i) + \text{di}
                         E.MUL.ADDC:
                                 if (i & size) = 0 then
                                          p \leftarrow \text{mul}(\text{size}, \text{h}, \text{cs}, \text{c}, \text{i}, \text{bs}, \text{b}, \text{i}) - \text{mul}(\text{size}, \text{h}, \text{cs}, \text{c}, \text{i} + \text{size}, \text{bs}, \text{b}, \text{i} + \text{size}) + \text{di}
                                 else
                                          p \leftarrow \text{mul(size,h,cs,c,i-size,bs,b,i)} + \text{mul(size,h,cs,c,i,bs,b,i-size)} + \text{di}
                                 endif
                         E.MULSUB, E.MULSUB.U, E.MULSUB.M:
                                 p \leftarrow mul(size,h,cs,c,i,bs,b,i) - di
                         E.MULSUBC:
                                 if i & size = 0 then
                                          p \leftarrow \text{mul}(\text{size}, h, \text{cs}, c, i, \text{bs}, b, i) - \text{mul}(\text{size}, h, \text{cs}, c, i + \text{size}, \text{bs}, b, i + \text{size}) - \text{di}
                                          p \leftarrow \text{mul}(\text{size}, \text{h}, \text{cs}, \text{c}, \text{i-size}, \text{bs}, \text{b}, \text{i}) + \text{mul}(\text{size}, \text{h}, \text{cs}, \text{c}, \text{i}, \text{bs}, \text{b}, \text{i-size}) - \text{di}
                                 endif
                endcase
```

New Sheet

```
z_2*(i+size)-1..2*i \leftarrow p
endfor
RegWrite(rd, 128, z)
enddef
```

Exceptions

None